

CE Specialist, Regenerative Agriculture

Position Title: Cooperative Extension Specialist, Regenerative Agriculture

Position: The Regenerative Agriculture CE specialist will test and contextualize emerging regenerative agriculture practices to help both growers and policymakers understand the benefits, limitations, and scaling potential of soil carbon management practices and assist growers in implementing practices that will help California meet its carbon neutrality goals. The need for this position arises from a lack of accessible expertise for diverse stakeholders to draw upon to implement existing and emerging regenerative agriculture techniques and technologies and quantify carbon storage benefits of regenerative practices. The position will provide statewide leadership across California addressing the important role agriculture plays in tackling climate change and the need for greater food system resilience. A Ph.D. in Soil Science, Agroecology, Agronomy, Environmental Engineering, or related discipline, with postdoctoral or related work experience is required. This position will report to the UC ANR Associate Vice-President and be housed by the Department of Life and Environmental Sciences in the School of Natural Sciences at UC Merced through a Memorandum of Understanding with UC ANR.

Justification:

California is committed to cutting greenhouse gas emissions by 40% by 2030 (AB32) and has pledged to be Carbon neutral by 2045 (B-55-18, AB1395). Soil carbon management can play a major role in climate stabilization while increasing food system resilience. As California strives for carbon neutrality in the next decades, California agriculture will be required to do its share to reduce greenhouse gas emissions, sequester soil carbon, and reverse land degradation. Regenerative agriculture methods, ranging from soil amendments (e.g., biochar, basalt, organic waste, mulching, and other forest biomass uses) to sustainable intensification and other approaches, are receiving attention from researchers and early adopters. Co-benefits include improved soil water retention (reduced irrigation demand) and reduced dependencies on chemical fertilizers and pesticides. Therefore, investing in regenerative agricultural management practices that reverse land degradation and rebuild soil carbon reserves is crucial for buffering fossil fuel emissions, stabilizing the earth's climate, and creating more resilient agriculture systems.

A Regenerative Agriculture Specialist at UC Merced will support farm advisors and growers in transitioning from resource-intensive and land-degrading practices. They will develop applied, soil-based climate solutions and bring them to scale regionally and globally. UC Merced researchers in the Departments of Life & Environmental Sciences and Civil & Environmental Engineering are well-positioned to collaborate with and provide scientific support to the specialist in a wide range of aspects, including the accounting of greenhouse fluxes and soil carbon sequestration; and assessing biodiversity, ecological functions, water quality. This position capitalizes on the proximity of UC Merced to ANR Research and Extension Centers in the Central Valley and is synergistic with the planned UC Smart Farm effort. UC Merced is the home campus of two CE specialists in related fields. Dr. Safeeq Khan, a soil scientist by training, leads a Forest Ecohydrology & Watershed Systems (FEWS) research team of undergraduate and graduate students, postdocs, project scientists, and staff research associates. Dr. Khan's research addresses complex relationships between water, vegetation, and climate in a rapidly changing environment, with specific focus on new management approaches for improving forest health and sustaining water resources in California. Dr. Tapan Pathak, an agricultural engineer by training, is an expert in applied climatology. He studies the trends and impacts of climate change on agricultural production and translating climate and weather data into useful agricultural decision support information.

Extension:

Statewide stakeholders include state and federal agriculture agencies, farm advisory groups, commodity boards, and agriculture-related community organizations. The specialist will communicate to inform local and regional stakeholder efforts promoting regenerative agriculture, disseminate analysis results, and facilitate application and adoption. The position is expected to focus on developing educational outreach programs to train and assist stakeholders in identifying and quantifying benefits of regenerative agriculture practices that increase carbon sequestration and reduce resource use, land subsidence, and greenhouse gas emissions. Delivery methods include research publications, white papers, presentations, workshops, short courses, field demonstrations, social media, and written and video content for internet and other distribution.

Research:

More research is needed to validate Regenerative Agriculture methods and learn to accurately account for their impact on soil carbon, health, and food system resilience. The specialist will work with researchers at UC Merced and other UCs on long-term monitoring of carbon sequestration and under regenerative practices. The specialist will publish results in peer review journals such as California Agriculture, Journal of Cleaner Production, Frontiers in Sustainable Food Systems, and Journal of Extension.

ANR Network:

The Regenerative Agriculture Specialist would capitalize on the proximity of UC Merced to ANR Research and Extension Centers in the Central Valley, and will play a lead role in designing a soil carbon monitoring program at the new UC Smart Farm effort. The specialist will work with UCANR Specialists and Advisors and in coordination with ANR Workgroups including Agroecology and Organic Farming Systems, Climate Change Adaptation, Conservation Tillage, Integrated Management of Soilborne Pests, Precision Agriculture; and ANR Program Teams including Diversified Farming and Food Systems, Climate Change, Forest & Rangeland Systems, and Research-to-Policy. The position supports ANR Strategic Initiatives, promoting both Sustainable Food Systems and Sustainable Natural Ecosystems in the face of climate change and the ANR Strategic Vision for healthy food systems, and healthy environments. The San Joaquin Valley has been underrepresented in Regenerative Ag research despite substantial opportunity within irrigated agriculture and rangeland management. The rangelands of the San Joaquin Valley represent an unprecedented opportunity to work with CDFA and the Healthy Soils Initiative to transform approaches to carbon management. Areas of ANR engagement include Climate Change Adaptation, Conservation Tillage, Integrated Management of Soilborne Pests, Precision Agriculture; and ANR Program Teams including Diversified Farming and Food Systems, Climate Change, Forest and Rangeland Systems, and Research-to-Policy. The position supports ANR Strategic Initiatives, promoting both Sustainable Food Systems and Sustainable Natural Ecosystems in the face of climate change and the ANR Strategic Vision for healthy food systems, and healthy environments. For example, the specialist would be a key player in Conservation Agriculture Systems Innovation (an ANR-led long-term effort at Westside REC) and advance the practice of regenerative agriculture in San Joaquin Valley agriculture. In addition, the specialist would bridge current UCM faculty and ANR led efforts on improving soil health and boosting carbon sequestration in foothill rangelands by redirecting biomass waste from agriculture, forestry, and municipal waste.

Network External to ANR:

Key partners in the area will include agricultural commodity groups, Central Valley CSU campuses, and Community Colleges, California Agriculture and Climate Network and its statewide coalition members and Science & Technical Advisory Council, and other groups such as The Nature Conservancy and Public Policy Institute of California. The specialist will have an opportunity to incorporate principles of sustainable agriculture in K-12 education through partnerships with UC Merced CalTeach, CITRIS NexTech, and FFA programs in Merced and neighboring counties.

Support:

UC Merced will provide administrative support and funding for general programmatic needs and travel. Office and lab space will be provided by Department of Life and Environmental Sciences (LES) and they will have access to core research facilities including the Environmental Analytical Lab and Stable Isotope Ecosystem Lab. The specialist will have an opportunity for an adjunct appointment in LES and the possibility of advising graduate students in the Environmental Systems graduate program. This position will take a lead role in guiding the new UC Merced Experimental Smart Farm, a 45-acre state-of-the-art facility dedicated to demonstrating regenerative practices and new technologies in sustainability.

Other support:

The specialist will work with UC Merced faculty to pursue multidisciplinary competitive grants and financial support from federal and state grants and other funding for agriculture, climate resilience, and carbon sequestration. Funding may come from various agencies (e.g., California Energy Commission, California Department of Food and Agriculture) and public or private entities including private growers and industry groups, as well as translational research grants around climate resilience from NSF and others. Grant and research support from UC Merced's Sierra Nevada Research Institute, Sponsored Programs Office, Center for Climate Justice, and Labor and Community Center, will lend capacity for extramural research and funding opportunities and support for accessible, justice-centered climate solutions. This position will also benefit from the Fresno-Merced Future of Food (F3) Innovation Initiative – a collaboration between UC ANR, UC Merced and others – to develop new ag-food technologies that can benefit small and medium farmers and food processors. A number of stakeholder groups and collaborators have already indicated their support for this position, including growers (Stuart Woolf of Woolf Farming), NGO partners (Ann Hayden, Eric Holst of Environmental Defense Fund) and ag-tech industry (Aaron Magenheimer, CEO AgTechInsight).

Headquarters and Coverage Area:

The position will be headquartered at the School of Natural Sciences, Department of Life and Environmental Sciences, UC Merced. Location provides laboratory and office space necessary for applied research. The position leverages recent UCANR interest in Sustainable Food Systems and Sustainable Natural Ecosystems with UC Merced faculty and CE Specialist expertise in soil health and sustainable management of complex systems.

Developed and proposed by:

This proposal was developed by internal stakeholders at UC Merced, including LES faculty members and ANR CE Specialists active in soil, climate, and agriculture research, and UC Merced Sierra Nevada Research Institute directors.